National Institute of Environmental Health Sciences

Plant molecular stress responses face climate change

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Abstract:

Environmental stress factors such as drought, elevated temperature, salinity and rising CO affect plant growth and pose a growing threat to sustainable agriculture. This has become a hot issue due to concerns about the effects of climate change on plant resources, biodiversity and global food security. Plant adaptation to stress involves key changes in the '-omic' architecture. Here, we present an overview of the physiological and molecular programs in stress adaptation focusing on how genes, proteins and metabolites change after individual and multiple environmental stresses. We address the role which '-omics' research, coupled to systems biology approaches, can play in future research on plants seemingly unable to adapt as well as those which can tolerate climatic change.

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Resource Description

Communication: ☑

resource focus on research or methods on how to communicate or frame issues on climate change; surveys of attitudes, knowledge, beliefs about climate change

A focus of content

Communication Audience: ☑

audience to whom the resource is directed

Researcher

Exposure : ☑

weather or climate related pathway by which climate change affects health

Ecosystem Changes, Extreme Weather Event, Food/Water Quality, Food/Water Security, Temperature

Extreme Weather Event: Drought

Food/Water Quality: Other Water Quality Issue

Water Quality (other): Salinity

Food/Water Security: Agricultural Productivity

Geographic Feature: ☑

resource focuses on specific type of geography

None or Unspecified

Geographic Location:

resource focuses on specific location

Global or Unspecified

Health Impact:

specification of health effect or disease related to climate change exposure

Health Outcome Unspecified

Mitigation/Adaptation:

mitigation or adaptation strategy is a focus of resource

Adaptation

Population of Concern: A focus of content

Population of Concern:

populations at particular risk or vulnerability to climate change impacts

Workers

Resource Type:

format or standard characteristic of resource

Review

Timescale:

time period studied

Time Scale Unspecified

Vulnerability/Impact Assessment:

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

A focus of content